REMARKS

Summary Of The Office Action & Formalities

Claims 1, 3, 5-7 and 24-26 are presently pending in this application. New claim 26 is added via this Amendment.

As an initial matter, Applicants respectfully request the Examiner to acknowledge and approve the proposed drawing correction submitted on August 16, 2001, wherein reference character "25a" was changed to --35a--.

Again, the Examiner is respectfully requested to initial and return a copy of the Form PTO-1449 submitted with the Information Disclosure Statement filed on April 9, 2001, with his next Office Action.

The prior art rejections are summarized as follows:

1. Claims 1, 3-5, 24 and 25 are rejected under 35 U.S.C. §103(a) as being unpatentable over Farnsworth (GB 1,483,053, of record) in view of Kohno (U.S. Patent No. 5,968,295, of record) and optionally in view of Gaudin (U.S. Patent No. 5,591,284, newly cited). Farnsworth, Kohno and Gaudin are applied in the same manner as set forth in the non-final rejection mailed on April 22, 2004 (paragraphs 3-5).

2. The Examiner rejects claim 6 under 35 U.S.C. §103(a) as being unpatentable over Farnsworth, Kohno and Gaudin as applied above and further in view of Okamoto (U.S. Patent No. 5,779,828, of record).

3. The Examiner also rejects claim 7 under 35 U.S.C. §103(a) as being unpatentable over Farnsworth, Kohno and Gaudin as applied above and further in view of Imamura (U.S. Patent No. 3,913,652, of record).

Applicants respectfully traverse these rejections in view of the following remarks.

Claim Rejections - 35 U.S.C. §103(a)

In rejecting claims 1, 3, 5, 24 and 25, the Examiner reiterates *verbatim* the grounds of rejection set forth in the previous Office Action of April 22, 2004, and adds:

> "As to the limitation requiring the outermost layer be between 1.0 and 1.2 times the axial width of the middle cord layer, both Figures 3b and 3c of Farnsworth depict a construction in which the high angled layer covers the middle cover and contains an axial width that is slightly staggered outward of the end of the middle cord layer. One of ordinary skill in the art at the time of the invention would have recognized that the amount of staggering is on the order of a couple of millimeters and well within the broad range of values that allows up to a 20% staggering. It is further noted that Farnsworth states that the tread width is on the order of 185 to 200 millimeters. Thus, a middle cord layer might have an

> axial width of approximately 150 millimeters- this allows for an outermost layer to have an axial width of up to 180 millimeters. It is evident that the range of the claimed invention is broad and defines embodiments that are consistent with a plurality of tire designs."

Office Action at pages 5-6.

Furthermore, the Examiner responds to Applicants' arguments set forth in the Amendment of July 22, 2004, as follows:

> "Applicant's arguments filed July 22, 2004 have been fully considered but they are not persuasive. Applicant contends that Gaudin teaches away from the claimed invention in that it specifically identifies the breaker strip arrangement of Figure 6 with the cord construction of Figure 2. Applicant further argues that the arrangement of Figure 6, for example, is not generally applicable to all breaker strip configurations. Lastly, applicant contends that the compression modulus (of the present invention) is carried out by the measuring method shown in Figure 7.
>
> "It is agreed that Gaudin describes a specific belt structure in which a high angled cord layer is disposed between an inner and outer low angle cord layer. However, in describing the axial widths of the respective belt layers, the teachings of Gaudin do not suggest that the plurality of belt assemblies depicted in Figures 6-11 are only specific to the disclosed construction. Applicant is pointed to Column 1, Lines 35-40 in which Gaudin states, 'Furthermore in belt designs, it is desirable to stagger the ply endings in the edge regions of the belt by employing plies of different widths. This gives a progressive reduction in stiffness and minimized stress concentration at the belt edge.' This description suggests that a staggered belt assembly is beneficial for belt designs in general- it is by no means specific only to the belt design of Gaudin. It is further

noted that Farnsworth is consistent with these teachings, as depicted in Figures 3a-3c. While Farnsworth fails to depict all possible staggered assemblies, a fair reading of Farnsworth suggests that a plurality of belt constructions are within the scope of Farnsworth. Given the three belt construction of Farnsworth, there are only 6 possible designs (varying axial widths), three of which are expressly depicted in the above noted figures. It is emphasized that Farnsworth fails to place a criticality on the specific staggering assembly but rather stresses the importance of a high angled, metal cord layer radially outside a pair of low angle, metal cord layers- this is the same belt construction of the claimed invention. Regarding the purported unexpected results, the original disclosure only states that the benefits of cut resistance and separation resistance result from the outermost cord layer being wider than the middle cord layer- the original disclosure fails to associate any criticality to the relationship between the outermost cord layer and the innermost cord layer. In this regard, Farnsworth depicts multiple embodiments (Figures 3B and 3C) in which the outermost, high angled cord layer is wider than the middle cord layer.

"Regarding the compression modulus, it is unclear if applicant is suggesting that the claimed property is not present in the coating rubber of Kohno- the arguments only state that a different method is performed in the inventive tire design as compared to usual measuring methods. While a different method might be used, Kohno does suggest the use of a high modulus material in an outermost belt layer in order to reduce local buckling of the cords- this is analogous to the benefits of improved buckling resistance set forth by the original disclosure. Thus, it is evident that the tire art has previously recognized the use of a high modulus material to form the outermost belt layer and one of ordinary skill in the art at the time of the invention would have readily appreciated the use of such a material in the tire construction of Farnsworth absent any conclusive showing of unexpected results."

Office Action at pages 8-10.

Applicants respectfully disagree.

With respect to the grounds of rejection that are identical to those set forth in the previous Office Action, Applicants maintain that these grounds of rejection are in error for the reasons of record (*see, e.g.*, Amendment filed July 22, 2004).

Regarding the additional grounds of rejection set forth in the present Office Action and noted above, Applicants submit that the Examiner continues to rely on *improper hindsight reconstruction*, using Applicants' disclosure, not the prior art teachings, as a blueprint for picking and choosing various features of tires from *different* applied references (e.g., Farnsworth, Kohno and Gaudin). In doing so, the Examiner ignores the fact that the disclosures of each applied reference, whether considered individually or as a whole, would actually *teach away* from the claimed invention.

For example, the Examiner acknowledges that Gaudin "describes a specific belt structure in which a high angled cord layer is disposed between an inner and outer low angle cord layer" and, therefore, does *not* describe the orientation of the cords in the first through third cord layers as required by the present invention. In fact, for the reasons set forth at pages 8-10 of Applicants' July 22 Amendment, Gaudin *teaches away* from the claimed structure.

The Examiner responds that Gaudin does not "suggest that the plurality of belt assemblies depicted in Figures 6-11 are only specific to the disclosed construction," and cites column 1, lines 35-40 of Gaudin. ("Furthermore in belt designs, it is desirable to stagger the ply endings in the edge regions of the belt by employing plies of different widths. This gives a progressive reduction in stiffness and minimized stress concentration at the belt edge."). Office Action at page 9. The Examiner is taking away from Gaudin more than what is actually taught or suggested by this disclosure.

While the quoted section of Gaudin may teach a general desirability to stagger the plies, it does not teach how to do so. Specifically, it makes no reference as to the relative widths of the plies, nor does it make any reference to the angles of the cords within each ply. On the other hand, when one reads further into the disclosure of Gaudin, the reference provides a *specific* relationship between the orientations of the cords and the relative widths of the plies. As explained in Applicants' last response, the arrangement in Fig. 6 is tied to the structure of Fig. 2, in which:

> "All four breaker strips 1-4 are steel cord fabric of cut steel cords laid parallel to each other and embedded in rubber. The cords of the main plies 1-3 are inclined with respect to the circumferential equator CE of the tire at angles of $\alpha 1$, $\alpha 2$ and $\alpha 3$ respectively. <u>These angles have values of 18°, 67° and 18° respectively. Breaker plies 1 and 2 have their cords inclined in the</u>

> same direction with respect to the circumferential equator CE whereas the cords of breaker ply 3 are oppositely inclined to the circumferential equator CE. This arrangement of the inclinations $\alpha 1$, $\alpha 2$ and $\alpha 3$ of the three main breaker plies 1-3 in relation to the tire circumferential equator CE and the radially disposed carcass ply cords 7 is shown in FIG. 2. The cords of the fourth ply 4 are inclined also at 18° in the same direction as the third ply 3. (Gaudin at column 3, lines 1-14) (emphasis added).
>
> "While the present invention has been illustrated by the tire shown in FIG. 1 and as described above, other arrangements of the breaker strip assembly 5 are possible within the scope of the invention, provided that the first and third plies 1 and 3 have opposite inclination angles in the range of 5° to 40° and the second ply 2 has an inclination the range of 40-85°. (Gaudin at column 3, lines 24-30) (emphasis added.)"

Alternative arrangements of ply cords directions and breaker ply widths are shown in FIGS. 3-5 and FIGS. 6-11, respectively. These arrangements also provide improved edging rubber looseness characteristics for the heavy duty tire. (Gaudin at column 3, lines 31-35).

Alternatively, at a minimum the first and third plies 1 and 3 have opposite inclination angles in the range of 5° to 40° and the second ply 2 has an inclination in the range of 40-85°. In either case, Gaudin would *teach away* from Applicants' invention. The Examiner cannot focus only on the disclosure at column 1, lines 35-40, while ignoring the teaching of Gaudin *as a whole*. Moreover, as already noted, the section

quoted by the Examiner at column 1, lines 35-40, is *silent* as to the orientations of the cords and relative widths of the plies. Therefore, the reference clearly lacks the requisite specific teaching or suggestion to render obvious Applicants' invention.

Likewise, although the Examiner acknowledges that "Farnsworth fails to depict all possible staggered assemblies," the Examiner offers the *conclusory* position that "a fair reading of Farnsworth suggests that a plurality of belt constructions are within the scope of Farnsworth."

First, it is not sufficient that Farnsworth merely suggest "a plurality of belt constructions." The reference *fails* to disclose the combination of three rubberized cord layers having the particular cord orientations and widths recited in the claims.

The Examiner argues that, "[g]iven the three belt construction of Farnsworth, there are only 6 possible designs (varying axial widths), three of which are expressly depicted in the above noted figures." Office Action at page 9. **The Examiner is clearly mistaken. In fact, there is an indefinite number of different possible designs, considering not only the belt width, but also the direction and inclination angle of the belt cord.** The Examiner then emphasizes "that Farnsworth fails to place a criticality on the specific staggering assembly but rather stresses the importance of a high angled, metal

cord layer radially outside a pair of low angle, metal cord layers- this is the same belt construction of the claimed invention." Office Action at page 9. Again, without being able to point to any disclosure in the prior art that provides direction to one skilled in the art on the critical combination of relative ply widths and cord orientations, the Examiner merely concludes that Applicants' structure would have been obvious, despite the fact that *none* of the *disclosed* staggered configurations in Farnsworth correspond to Applicants' claimed invention.

Further evidence of the deficiencies in the grounds of rejection can be found in the conclusory positions set forth at pages 5-6 of the Office Action, with respect to the limitation that the outer layer is 1.0-1.2 times that of the middle cord layer. The Examiner takes the position that Farnsworth depicts a "construction in which the high angled layer covers the middle cover and contains an axial width that is slightly staggered outward of the end of the middle cord layer." (Emphasis added.) In fact, "slightly" is a word of degree that has little meaning in this context. The drawings in Farnsworth are not disclosed as being to scale and the reference does not provide any hint that the outer cord layer should be 1.0-1.2 times that of the middle cord layer. The

Examiner's position is mere supposition, lacking any basis in a prior art teaching or suggestion.

As explained in the present application, from a viewpoint of the durability at the belt end, the width of the outermost cord layer is 1.0-1.2 times the width of the middle cord layer. On the other hand, when the width of the innermost cord layer is wider than the width of the outermost cord layer (i.e., the width of the outermost cord layer is narrower than the width of the innermost cord layer), this is very effective to prevent the intrusion of cut failure generated in a place exceeding the widthwise end of the outermost cord layer. That is, the cut resistance is improved by making the width of the outermost cord layer narrower than the width of the innermost cord layer.

The Examiner also notes that "Farnsworth states that the tread width is on the order of 185 to 200 millimeters. Thus, a middle cord layer might have an axial width of approximately 150 millimeters- this allows for an outermost layer to have an axial width of up to 180 millimeters." (Emphasis added.) Again, the Examiner's mere belief as to how one skilled in the art "might" have sized the middle cord layer is not sufficient to render the claimed feature obvious.

Finally, as to Kohno, Kohno discloses the modulus of elasticity for the circumferential layer only. Kohno is silent about the modulus of elasticity of the rubber coating for the slant layer (9). In the present invention, the recited modulus of elasticity (greater than 200 kgf/cm^2) is for the rubber coating of the outer belt layer having cords with a high degree of inclination.

2. *Claim 6 Over Farnsworth, Kohno And Gaudin As Applied In Claim 1 Above And Further In View Of Okamoto (US 5,779,828, of record).*

In rejecting claim 6 over Farnsworth, Kohno and Gaudin as applied in claim 1 above and further in view of Okamoto (US 5,779,828, of record), the Examiner reiterates the grounds set forth in the previous Office Action.

Without agreeing to the Examiner's additional arguments with respect to claim 6, Applicants submit that this claim is allowable at least by reason of its dependency.

3. *Claim 7 Over Farnsworth, Kohno And Gaudin As Applied In Claim 1 Above And Further In View Of Imamura (US 3,913,652, of record).*

In rejecting claim 7 over Farnsworth, Kohno and Gaudin as applied in claim 1 above and further in view of Imamura (US 3,913,652, of record), the Examiner reiterates the grounds set forth in the previous Office Action.

Without agreeing to the Examiner's additional arguments with respect to claim 7, Applicants submit that this claim is allowable at least by reason of its dependency.

4. Claim 24

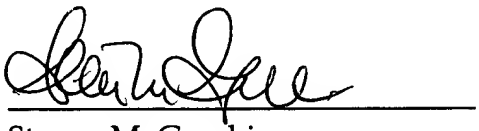
Claim 24, which recites, *inter alia,* that the cord extending directions of the outermost layer and the middle layer are the same, should be clearly allowable over Farnsworth and the other cited art.

By this Amendment, claim 26 is added to further define claims 24 and 25 by reciting the specific ratio of widths of the outer and middle cord layers. This combination of features (i.e., in claims 24+25+26) is clearly neither taught nor suggested by the cited art.

In view of the preceding amendments and remarks, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue that the Examiner feels may be best resolved through a personal or telephonic interview, he is kindly requested to contact the undersigned attorney at the local telephone number listed below.

The USPTO is directed and authorized to charge all required fees (except the Issue/Publication Fees) to our Deposit Account No. 19-4880. Please also credit any over-payments to said Deposit Account.

Respectfully submitted,



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